

***A Comparison and
Cross-Reference of
Commercial Low-Level
Radioactive Waste
Acceptance Criteria***

***National Low-Level Waste
Management Program***

April 1997

A Comparison and Cross-Reference of Commercial Low-Level Radioactive Waste Acceptance Criteria

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April 1997

**Prepared for the
U.S. Department of Energy
DOE Idaho Operations Office**

ABSTRACT

This document, prepared by the National Low-Level Waste Management Program at the Idaho National Engineering and Environmental Laboratory, is a comparison and cross-reference of commercial low-level radioactive waste acceptance criteria. Many of these are draft or preliminary criteria as well as implemented criteria at operating low-level radioactive waste management facilities. Waste acceptance criteria from the following entities are included: U. S. Nuclear Regulatory Commission, South Carolina, Washington, Utah, Nevada, California, Illinois, Texas, North Carolina, Nebraska, Pennsylvania, New York, and the Midwest Compact Region. Criteria in the matrix include the following: physical form, chemical form, liquid limits, void space in packages, concentration averaging, types of packaging, chelating agents, solidification media, stability requirements, sorptive media, gas, oil, biological waste, pyrophorics, source material, special nuclear material, package dimensions, incinerator ash, dewatered resin, transuranics, and mixed waste. Each criterion in the matrix is cross-referenced to its source document so that exact requirements can be determined.

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INTRODUCTION

This document is a matrix of Waste Acceptance Criteria (WAC) derived from various states, commercial facilities, regulations, and license agreements. Each section presents specific WAC (e.g., physical form, chemical form, and liquid limits) and compares them to the various states, Nuclear Regulatory Commission (NRC), Compact Region, and commercial disposal facilities' source requirements for these criteria. This comparison provides a cross-reference between each individual criterion and the applicable source requirements.

Instructions for Use of Matrix

For simplicity, each criterion in the matrix has been paraphrased. References to the appropriate source document's paragraph or condition are contained in each criterion box of the matrix below the dashed line following the paraphrased criterion. Abbreviations used in the matrix are included in the following section entitled *Sources for the Commercial Low-Level Radioactive Waste Acceptance Criteria That Appear in the Matrix*. For exact wording of each criterion, refer to the appropriate source document(s) for that state, agency, or entity. For ease of handling and clarity, the matrix compares 21 criteria in groups of three in the following order:

- Physical form, chemical form, liquid limits
- Void space in packages, concentration averaging, types of packaging
- Chelating agents, solidification media, stability requirements
- Sorptive media, oil, gas
- Biological waste, pyrophorics, source material
- Special nuclear material, package dimensions, incinerator ash
- Dewatered resin, transuranics, mixed waste.

Sources for the Commercial Low-Level Radioactive Waste Acceptance Criteria That Appear in the Matrix:

U. S. Nuclear Regulatory Commission (NRC):

1. Title 10 of the Code of Federal Regulations, Part 61
2. Title 10 of the Code of Federal Regulations, Part 20, Appendix F
3. Branch Technical Position on Waste Form (Revision 1), January 1991 (Abbreviation Used in Matrix: BTP)

South Carolina (SC):

1. South Carolina Department of Health and Environmental Control Radioactive Material, License #097, Amendment 46 (Abbreviation Used in Matrix: SCL)
2. U.S. Nuclear Regulatory Commission License #12-13536-01, Amendment 26 (Abbreviation Used in Matrix: NRCL)
3. Barnwell Waste Management Facility Site Disposal Criteria (Chem-Nuclear Systems, Inc. Document # S20-AD-010 Revision 12) (Abbreviation Used in Matrix: BSC)

Washington (WA):

1. State of Washington Radioactive Materials License #WN-I019-2, Amendment #18 (Abbreviation Used in Matrix: WAL)
2. U.S. Nuclear Regulatory Commission License #16-19204-01, Amendment 11 (Abbreviation Used in Matrix: NRCL)
3. State of Washington Administrative Code 246-249-080 (for NORM)

Utah (UT):

1. State of Utah Radioactive Materials License # UT 2300249, Amendment #20 (Abbreviation Used in Matrix: UTL)
2. State of Utah Hazardous Waste Permit EPA Identification #UTD982598898 (Abbreviation Used in Matrix: UTHWP)

3. Letter dated August 31, 1995 from Vernon E. Andrews (Envirocare) to Dane Finefrock (UT Division of Radiation Control) regarding concentration averaging practices (Abbreviation Used in Matrix: LTR-08/95)
4. Reply (dated September 6, 1995) to LTR-08/95 from William Sinclair (UT Radiation Control Board) to Vernon E. Andrews (Envirocare) regarding concentration averaging practices (Abbreviation Used in Matrix: LTR-09/95)
5. Information Notice (dated May 7, 1996) from the Division of Radiation Control, Utah Department of Environmental Quality (Abbreviation Used in Matrix: UT IN-05-96)

Nevada (NV):

Nevada State Health Division Radioactive Material License #13-11-0043-02, Amendment 13

California (CA):

California Department of Health Services Radioactive Material License #4505-36

Illinois (IL):

Illinois Department of Nuclear Safety Notice of Proposed Rules (draft February 1991), Title 32 Chapter II Subchapter d Part 607

Texas (TX):

Texas Low-Level Radioactive Waste Disposal Authority Draft Proposed Rules, Title 31, Part XV Chapter 451 Subchapter B

North Carolina (NC):

December 1993 License Application Wake/Chatham Safety Analysis Report, Chapter 11, Revision 1, submitted by Chem-Nuclear Systems, Inc. to the North Carolina Division of Radiation Protection

Nebraska (NE):

Waste Acceptance Criteria NOP-8101-1.01, Revision 0, submitted to the Nebraska Department of Health by U.S. Ecology, Inc. (dated May 19, 1995)

Pennsylvania (PA):

Title 25 PA Code Chapter 236

New York (NY)

1. 6 NYCRR Part 382, Regulation of Low-Level Radioactive Waste (LLRW), Disposal Facilities: Certification of Proposed Sites and Disposal Methods
2. 6 NYCRR Part 383, Regulation of Low-Level Radioactive Waste (LLRW), Disposal Facilities: Design, Construction, Post-Closure, and Institutional Control

Midwest Compact Region (MW):

Preliminary Waste Acceptance Criteria (dated January 27, 1995)

Waste Acceptance Criteria:

Physical Form
Chemical Form
Liquid Limits

COMMERCIAL LOW-LEVEL RADIOACTIVE WASTE ACCEPTANCE CRITERIA			
	PHYSICAL FORM	CHEMICAL FORM	LIQUID LIMITS
NRC	Solid, absorbed liquid, gas ----- 61.56(a)(2) 61.56(a)(7)	No explosive or gaseous reactions ----- 61.56(a)(4) 61.56(a)(5)	≤% vol. HIC or ≤0.5% vol. for other waste ----- 61.56(a)(3) 61.56(b)(2)
SC	Solid, gas ----- SCL Condition 32(A) SCL Condition 34 SCL Condition 47 BSC 13.3 BSC 13.5	No xylene, toluene, dioxane, organic scintillation liquids or other hazardous organic solutions, solidified or otherwise. Will accept Ecosint A, Ecosint O, Opti-fluor, Ultima Gold, Ultima Gold LLT, Ready-Safe, Ready Cap, Ready Filter, and Meltilex. No explosive or gaseous reactions ----- SCL Condition 43 SCL Condition 49 SCL Condition 50 BSC 13.5.3 BSC 13.7 BSC 13.9 BSC 13.11	≤% vol. HIC or ≤0.5% vol. for other waste ----- SCL Conditions 32 (A-C) BSC 13.6
WA	Solid, absorbed liquid, liquids (Class A only not to exceed 50 mL in vials used for clinical testing), gas ----- WAL Condition 28 WAL Condition 31 WAL Condition 32 WAL Condition 35	No explosive or gaseous reactions ----- WAL Condition 22 WAL Condition 23	≤% vol. HIC or ≤0.5% vol. for other waste ----- WAL Condition 29 WAL Condition 30
UT¹	Solid (volumetric bulky soil or soil-like materials or debris) ----- UTL Condition 7 UTL Condition 38	Various hazardous chemicals for mixed waste ----- UTHWP	No free liquid is acceptable ----- UTL Condition 18
NV²	Solid, absorbed liquid, gas ----- Condition 21 Condition 24 Condition 27 Condition 30	No explosive or gaseous reactions ----- Condition 19 Condition 20	≤% vol. HIC or ≤0.5% vol. for other waste ----- Condition 25 Condition 26
CA³	Solid, gas -----	No xylene, toluene, dioxane, scintillation fluids or other organic	≤% vol. HIC or ≤0.5% vol. for other waste

COMMERCIAL LOW-LEVEL RADIOACTIVE WASTE ACCEPTANCE CRITERIA			
	PHYSICAL FORM	CHEMICAL FORM	LIQUID LIMITS
	Condition 55 Condition 65	liquids. No explosive or gaseous reactions ----- Condition 53 Condition 54 Condition 64	----- Condition 57 Condition 58
IL⁴	Solid ----- 607.30(a)	No explosive or gaseous reactions ----- 607.30(i) 607.30(k)	Atmospheric condensation only ----- 607.30(a)
TX⁴	Solid, absorbed liquid, gas ----- 451.26(b) 451.26(c) 451.26(e)(4)	No explosive or gaseous reactions ----- 451.26(e)(1) 451.26(e)(2)	≤1% vol. HIC or 0.5% vol. for stabilized waste ----- 451.26(b)
PA⁴	Solid, gas ----- 236.521(3) 236.521(8)	No explosive or gaseous reactions ----- 236.521(5) 236.521(6)	≤1% vol. HIC or 0.5% vol. for other waste ----- 236.523
NY⁴	Solid, liquid, gas ----- 382.81(a)	No explosive or other reactions at normal temp. and pressure and no explosive or exothermic reactions with water ----- 382.81(a)(4)	<0.5% of waste volume ----- 382.81(a) (3)
NC⁵	Solid ----- 11.3(2) 11.3(5)	No explosive or other reactions at normal temp. and pressure and no explosive or exothermic reactions with water ----- 11.3(10)	<1% vol. HIC or 0.5% vol. for other waste ----- 11.3(3) 11.3(4)
NE⁵	Solid, absorbed liquid, liquids (Class A only not to exceed 50 mL in vials used for clinical testing), gas ----- 8.12 8.13 8.17 8.18 8.21	No explosive or gaseous reactions ----- 8.7 8.10	≤1% vol. HIC or 0.5% vol. for other waste ----- 8.13 8.14 8.15
MW⁶	Solid, gas -----	No explosive or gaseous reactions. -----	≤1% vol. HIC or 0.5% vol. for other waste. Must be

COMMERCIAL LOW-LEVEL RADIOACTIVE WASTE ACCEPTANCE CRITERIA			
	PHYSICAL FORM	CHEMICAL FORM	LIQUID LIMITS
	B (7) B (9) B (10)	B (3) B (4)	noncorrosive, pH 4-11. ----- B (8) B (11) B (12) B (13)

Waste Acceptance Criteria:

Void Space in Packages
Concentration Averaging
Types of Packaging

COMMERCIAL LOW-LEVEL RADIOACTIVE WASTE ACCEPTANCE CRITERIA			
	VOID SPACE IN PACKAGES	CONCENTRATION AVERAGING	TYPES OF PACKAGING
NRC	Minimize ----- 61.56(b)(3)	Yes ----- 61.55(a)(8)	No cardboard or fiberboard ----- 61.56(a)(1)
SC	≤5% vol. for all waste unless placed in a high integrity container ----- SCL Condition 39 BSC 8.1 NOTE	Yes, but not for sealed sources or filters encapsulated in solidification medium ----- SCL Condition 31(a) BSC 13.3.2.4 BSC 13.4.4	No cardboard, corrugated paper, or fiberboard. Must be in wood, steel, or HIC. All packages must have proper lifting devices in place and wood boxes will be banded with metal bands. ----- SCL Condition 59 SCL Condition 60 SCL Condition 61 SCL Condition 64 BSC 8.7 BSC 8.8 BSC 8.9
WA	<15% vol. for stable waste ----- WAL Condition 21	Yes, but not for filters encapsulated in a solidification agent ----- WAL Appendix B Note 1	No cardboard, corrugated paper, fiberboard or wood. All packages must have proper lifting devices in place. ----- WAL Condition 18 WAL Condition 25
UT¹		Weighted average of a <u>shipment</u> (defined as a series of conveyances from a single generator arriving within 72 hours) will meet license concentrations; however, single conveyances within the shipment may be up to 10 times the license limit up to the Class A limit. If the weighted average of the <u>shipment</u> exceeds the license limit, it may be accepted up to 10 times the license limit. It will then either be blended with other waste to meet license limits (for soil-like materials) or clean soil, CLSM concrete, or other waste (for debris). ----- UTL Condition 8 UTL Condition 14	Most waste is disposed as bulk or unpackaged material; however, oversized debris in the form of the following filled containers may be accepted: B-25 boxes, B-12 boxes, standard drums of at least 50 gallons, over-pack drums, and other monolithic forms similar in size and shape to those listed. ----- UTL Condition 37 UTL Condition 38

COMMERCIAL LOW-LEVEL RADIOACTIVE WASTE ACCEPTANCE CRITERIA			
	VOID SPACE IN PACKAGES	CONCENTRATION AVERAGING	TYPES OF PACKAGING
		UTL Condition 16 UTL Condition 38 LTR 08/95	
NV²	<15% vol. for stable waste. Does not apply to HICs. ----- Condition 18	Yes, includes solidification agent wt. & vol. ----- Appendix B(1)	No cardboard, corrugated paper, fiberboard or wood ----- Condition 15 Condition 16 Condition 17
CA³	<15% vol. for stable waste. Does not apply to HICs. ----- Condition 52	Yes, except for sealed sources or filters encapsulated in solidification medium ----- Appendix A Note a	No cardboard, corrugated paper, fiberboard, or wood. Closed metal, polyethylene, or HICs only. Proper lifting devices must be attached. ----- Condition 48 Condition 50 Condition 51
IL⁴	Minimize ----- 607.30(c)	Yes, except for solids encapsulated in solidification medium. ----- 607.30(a)	
TX⁴	Minimize ----- 451.25(h)		No cardboard, corrugated paper, wood, or fiberboard. ----- 451.25(c) 451.25(i)
PA⁴	Minimize ----- 236.524	Yes ----- 236.507	No cardboard, wood, or fiberboard ----- 236.521
NY⁴	Minimize ----- 382.81(b)(2)	Yes, except for sealed sources or filters encapsulated in solidification medium ----- 382.80(h)(2)	No cardboard or fiberboard ----- 382.81(a)(1)
NC⁵		Yes, includes solidification agent wt. & vol. -----	No cardboard or fiberboard. Radiation level cannot exceed 500 R/hr on contact.

COMMERCIAL LOW-LEVEL RADIOACTIVE WASTE ACCEPTANCE CRITERIA			
	VOID SPACE IN PACKAGES	CONCENTRATION AVERAGING	TYPES OF PACKAGING
		11.3(1)(a)	----- 11.3(12) 11.5
NE⁵	≤5 vol. of disposal container ----- 8.6		No cardboard, corrugated paper, wood, fiberboard, or combustible packaging. All drums must be palletized on nonwood pallets. Proper lifting devices must be included. ----- 8.3.1 8.4 10.2 11.2 12.1
MW⁶	Minimize ----- C (2)		No cardboard, corrugated paper, fiberboard, or wood as outer disposal container. Will accept HICs and containers approved by DOT/NRC/host state. ----- C (3) C (4) C (5)

Waste Acceptance Criteria:

Chelating Agents
Solidification Media
Stability Requirements

COMMERCIAL LOW-LEVEL RADIOACTIVE WASTE ACCEPTANCE CRITERIA			
	CHELATING AGENTS	SOLIDIFICATION MEDIA	STABILITY REQUIREMENTS
NRC	>0.1% must be identified and estimated ----- 20 App. F (I)	Test in accordance with Branch Technical Position on Waste Form ----- BTP	HIC, inherent characteristics or process Class B & C ----- 61.56(b)(1)
SC	§% by weight. Between 0.1% and 8% must be stabilized. % applies to final waste form. ----- SCL Condition 46 BSC 13.18	Vinyl ester styrene, cement, full-formula oxidized bitumen, vinyl chloride for stable waste. Regardless of class, evaporator concentrates must be solidified. Aquaset II-H and Petroset II may be used for Class A Unstable. ----- SCL Conditions 33(A-E) SCL Condition 35 BSC 13.5.2 BSC 13.6	HIC, inherent characteristics or process Class B & C and A if it has nuclides with >5 yr half-life at ≥1 µci/cc. All wastes will be placed in concrete overpacks at the disposal facility. ----- SCL Condition 33(B) SCL Condition 38 SCL Conditions 39 BSC 8.1 NOTE BSC 8.2 NOTE
WA	Solidify or stabilize pretreatment conc. of >1% by weight ----- WAL Condition 41	Aztech, oxidized bitumen, concrete, vinyl ester styrene for stable waste. In addition to these, Atcor cement, Aquaset I & II, straight-distilled bitumen, Chem-Nuclear cement, structural concrete, Delaware Custom Media, Envirostone, LN Technologies Portland Cement for Oils, Pacific Nuclear Cement, Petroset I & II, Safe T Set, and SEG Cement may be used for Class A Unstable. ----- WAL Appendix C WAL Appendix D	HIC, inherent characteristics or process Class B & C and A if it is IX resin with ≥1 µci/cc of nuclides with >5 yr half-life (Co-60 can be ≤0 µci/cc) ----- WAL Condition 26(D) WAL Appendix D WAL Appendix E WAL Condition 36
UT¹			No stability is required since all wastes accepted are below Class A limits ----- UTL Condition 8
NV²	Stabilize >1% by weight ----- Condition 40	Aztech, oxidized bitumen, Chem-Nuclear cement, concrete, vinyl ester styrene, LN Technologies cement, Stock Equipment cement, Westinghouse-Hittman cement for stable waste. In addition, Aquaset I & II, straight-distilled bitumen, structural concrete, Delaware Custom	HIC, inherent characteristics or process Class B & C ----- Condition 22(c) Condition 25 Appendix D

COMMERCIAL LOW-LEVEL RADIOACTIVE WASTE ACCEPTANCE CRITERIA			
	CHELATING AGENTS	SOLIDIFICATION MEDIA	STABILITY REQUIREMENTS
		media, Envirostone, Hittman Grout, Petroset I & II, and Safe T Set for unstable waste. ----- Appendix C Appendix D	
CA ³	>0.1% pretreatment conc. must be solidified or stabilized ----- Condition 69	Aztech, oxidized bitumen, Chem-Nuclear cement, concrete, vinyl ester styrene, LN Technologies cement, Stock Equipment cement, Westinghouse-Hittman cement for stable waste. In addition, Aquaset I & II, straight-distilled bitumen, structural concrete, Delaware Custom media, Envirostone, Hittman Grout, Petroset I & II, and Safe T Set for unstable waste. ----- Appendix D Appendix E	HIC, inherent stability or process Class B & C and Class A if >30 R/hr. ----- Condition 58
IL ⁴	§% by weight ----- 607.30(f)		HIC or process Class B & C ----- 607.30(b)
TX ⁴	§% by weight ----- 451.25(e)		HIC, inherent characteristics or process Class B & C ----- 451.26(a)
PA ⁴	>0.1% by weight must be identified ----- 236.532		HIC, inherent characteristics, or processing to a stable form ----- 236.522(a) 236.522(b)
NY ⁴			HIC, inherent characteristics, or processing to a stable form ----- 382.81(b)(1)
NC ⁵	>0.1% but §% by weight must be stabilized. HIC alone cannot meet this requirement ----- 11.3(14)		All waste will be placed in overpacks for stability ----- 11.3(13) 11.5(3)
	Solidify or stabilize >0.1%	Aztech, oxidized bitumen, concrete,	In accordance with NRC BTP

COMMERCIAL LOW-LEVEL RADIOACTIVE WASTE ACCEPTANCE CRITERIA			
	CHELATING AGENTS	SOLIDIFICATION MEDIA	STABILITY REQUIREMENTS
NE⁵	pretreatment concentration. ----- 8.26	vinyl ester styrene for stable waste. In addition to these, Atcor cement, Aquaset I & II, straight-distilled bitumen, Chem-Nuclear cement, structural concrete, Delaware Custom Media, Envirostone, Pacific Nuclear Portland Cement, Petroset I & II, Safe T Set, and SEG Cement may be used for Class A Unstable. ----- Appendix B Appendix C	and vendor topical reports. ----- 8.14 9.3 Appendix C Appendix D
MW⁶	§% by weight after treatment. ----- B (14)	Must meet requirements of NRC BTP on Waste Form. ----- B (16)	Approved stabilization medium or HIC. ----- B (2)

Waste Acceptance Criteria:

Sorptive Media

Oil

Gas

COMMERCIAL LOW-LEVEL RADIOACTIVE WASTE ACCEPTANCE CRITERIA			
	SORPTIVE MEDIA	OIL	GAS
NRC	Allowable ----- 61.56(a)(2)		≤ 5 atm. at 20° C and max. 100 curies ----- 61.56(a)(7)
SC	Use only for incidental and unintentional liquid in otherwise dry solids. ----- SCL Condition 32(A) SCL Condition 34	≤ 1% vol. trace and unintentional (absorbed) ----- SCL Condition 52 BSC 13.8	Kr-85 and Xe-133 at ≤ 5 atm. and max. 100 curies. Sealed tritium gas sources (≤ 5 atm.) at ≤ 1,000 curies per disposal container. ----- SCL Condition 47 BSC 13.3
WA	May be used for liquids and listed in Appendix G of license WN-I019-2, Amendment 18. Includes many clays, diatomaceous earths, perlites, and others ----- WAL Appendix G	Solidify or stabilize pretreatment conc. of >10% by weight ----- WAL Condition 40	≤ 5 atm. at 20° C and max. 100 curies ----- WAL Condition 35
UT¹			
NV²	May be used for liquids and listed in Appendix E of license 13-11-0043-02, Amendment 13. Includes many clays, perlites, diatomaceous earths, and others ----- Appendix E	Solidify or stabilize pretreatment conc. of >10% by weight ----- Condition 35	≤ 5 atm. at 20° C and max. 100 curies ----- Condition 30
CA³	Use only for incidental and unintentional liquid in otherwise dry solids ----- Condition 55 Appendix C	≤ 1% vol. trace and unintentional ----- Condition 68	≤ 5 atm. at 20° C and max. 100 curies. Tritium no more than 100 curies - must be special packaged. ----- Condition 65 Condition 70
IL⁴	Only for atmospheric condensation. Cannot be used in lieu of solidification to meet "no liquid" requirement ----- 607.30(a)		
TX⁴	Allowable, but types not specified -----	≤ 1% vol. trace -----	≤ 5 atm. at 20° C and max. 100 curies

COMMERCIAL LOW-LEVEL RADIOACTIVE WASTE ACCEPTANCE CRITERIA			
	SORPTIVE MEDIA	OIL	GAS
	451.26(c)	451.26(g)	----- 451.26(e)(4)
PA⁴	Not acceptable ----- 236.521(3)		<1.5 atm. at 20° C and max. 100 curies ----- 236.521(8)
NY⁴	Not acceptable ----- 382.81(a)(2)	≤5% vol. trace ----- 383-8.3(a)(4)	≤5 atm. at 20° C and max. 100 curies ----- 382.81(a)(7)
NC⁵	Use only for incidental and unintentional liquid in otherwise dry solids. ----- 11.3(2)	≤% vol. trace ----- 11.3(11)	
NE⁵	May be used for liquids with approval; otherwise may only be used for incidental free standing liquid. Approved sorbents listed in Appendix E. ----- 8.17 Appendix E	Solidify or stabilize pretreatment conc. of >10% by weight ----- 8.25	≤5 atm. at 20° C and max. 100 curies ----- 8.21
Mw⁶	Not acceptable except in packages of radioactive consumer products ----- B (9) C (9)	<1% vol. incidental before solidification. ----- B (15)	≤5 atm. at 20° C and max. 100 curies of noble gases ----- B (7)

Waste Acceptance Criteria:

**Biological Waste
Pyrophorics
Source Material**

COMMERCIAL LOW-LEVEL RADIOACTIVE WASTE ACCEPTANCE CRITERIA			
	BIOLOGICAL WASTE	PYROPHORICS	SOURCE MATERIAL
NRC	Must be treated to reduce biological, pathogenic, or infectious hazards. ----- 61.56(a)(8)	Treat or package to be nonflammable ----- 61.56(a)(6)	
SC	Must be in certified 17H DOT package with 4-mil. liner layered with slaked lime and ag grade 4 vermiculite or medium grade diatomaceous earth (ratio 30:1:10) and double packaged with at least 4 in. of absorbent in bottom of outside container and absorbent surrounding the upright inner container. Must have standard ring and bolt closure on inner container. ----- SCL Condition 53 BSC 13.2	Must be treated or packaged to be nonflammable ----- SCL Condition 51 BSC 13.9	60,000 lb ----- SCL Condition 5(B) SCL Condition 6(B) SCL Condition 7(B)
WA	Must be in 4-mil. liner layered with absorbent (excluding perlites) and lime. Must be double packaged with absorbent in outside container. ----- WAL Condition 33 WAL Condition 34	Cannot react violently with water, moisture or agitation ----- WAL Condition 23	36,000 kg. Will also accept large volume NORM of 9.002 µci/cc ----- WAL Condition 6(B) WAL Condition 7(B) WAL Condition 8(B) WA Admin. Code 246-249-080 for NORM
UT¹			
NV²	Must be in 4-mil. liner layered with absorbent and lime. Must be double packaged with absorbent in outside container. ----- Condition 28 Condition 29	Cannot react violently with water, moisture or agitation ----- Condition 20	36,000 kg. ----- Condition 6(B) Condition 7(B) Condition 8(B)
CA³	Must be in 4-mil. liner layered with slaked lime and medium grade diatomaceous earth (ratio 30:1:10) and double packaged with absorbent in outside container.	Cannot react violently with water, moisture or agitation ----- Condition 54	36,000 kg. ----- Condition 6(b) Condition 7(b) Condition 8(b)

COMMERCIAL LOW-LEVEL RADIOACTIVE WASTE ACCEPTANCE CRITERIA			
	BIOLOGICAL WASTE	PYROPHORICS	SOURCE MATERIAL
	----- Condition 61 Condition 62		
IL⁴	Must be treated to reduce biological, pathogenic, or infectious hazards. ----- 607.30(h)	Must be treated to eliminate pyrophoric hazard. ----- 607.30(g)	
TX⁴	Double pkg. with absorbent. Must be layered with slaked lime and medium grade diatomaceous earth (ratio 30:1:10) ----- 451.25(f) 451.26(f)	Must be treated or packaged to be nonflammable ----- 451.26(d)	
PA⁴	Must be treated to reduce potential hazard from nonradiological materials ----- 236.521(9)	Must be treated and packaged to be nonflammable ----- 236.521(7)	
NY⁴	Must be treated to reduce potential hazard from nonradiological materials. Animal carcasses human tissue, and petroleum-based liquids must be incinerated or stabilized. ----- 382.81(a)(8) 383.8.3(a)	Must be treated and packaged to be nonflammable ----- 382.81(a)(6)	NARM allowed after review ----- 383-8.10 382.83
NC⁵		Final waste form cannot be pyrophoric or flammable ----- 11.3(11)	
NE⁵	Animal carcasses must be in 4-mil. liner layered with absorbent (excluding perlites) and lime (ratio 10:1). Must be double packaged (DOT 7A or 17H) with absorbent in outside container. Other biological waste must be treated to reduce the hazard and packaged similarly.	Final waste form must be treated, prepared, and packaged to be nonflammable. ----- 8.8	

COMMERCIAL LOW-LEVEL RADIOACTIVE WASTE ACCEPTANCE CRITERIA			
	BIOLOGICAL WASTE	PYROPHORICS	SOURCE MATERIAL
	<p>-----</p> <p>8.19</p> <p>8.20</p>		
MW⁶	<p>Biological, pathogenic, and infectious wastes must be treated to reduce potential hazard from nonradiological materials. Untreated animal carcasses and biowaste capable of generating gas or fumes are not acceptable. Prior practice of packaging carcasses in poly-liners, double steel drums, lime, and absorbent will not be permitted as final waste form.</p> <p>-----</p> <p>B (6)</p> <p>C (6)</p>	<p>Cannot react violently with water, moisture, or agitation.</p> <p>-----</p> <p>B (3)</p>	

Waste Acceptance Criteria:

**Special Nuclear Material
Package Dimensions
Incinerator Ash**

COMMERCIAL LOW-LEVEL RADIOACTIVE WASTE ACCEPTANCE CRITERIA			
	SPECIAL NUCLEAR MATERIAL	PACKAGE DIMENSIONS	INCINERATOR ASH
NRC			
SC	200 g U-233 or 350 g U-235 max. in a package. ----- NRCL Condition 1 SCL Condition 40 BSC 13.10	No dimensions are specified in the license although all classes will be placed in concrete overpacks called vaults at the disposal facility. Dimensions in BSC are max. box size of 9 ft 4 in. L x 7 ft 6 in. W x 9 ft 2 in. H with max. weight of 54,000 lb. ----- SCL Condition 39 BSC 7.5 BSC 8.11 BSC 9.3.1	Must solidify, treat or package (with binding matrix) to be nondispersible ----- SCL Condition 43 SCL Condition 45 BSC 13.7.1.2
WA	60 g U-233 or 100 g U-235 or 60 grams plutonium max. in a package ----- NRCL 5(a)-(c) NRCL 6		Must be solidified, granular or treated to be nondispersible in air ----- WAL Condition 39
UT¹	350 g U-235 or 200 g U-233 or 200 g Pu ----- UTL Condition 13		
NV²	200 g U-233 or 350 g U-235 or 200 g plutonium max. per package ----- Condition 6(C) Condition 7(C) Condition 8(C)		Must be solidified, granular or treated to be nondispersible in air ----- Condition 33
CA³	500 g U-235 or 300 g U-233 or 300 g plutonium max. per shipment ----- Note to Condition 8(c)		Must be treated to be nondispersible in air ----- Condition 67
IL⁴			Must be solidified ----- 607.30(a)(2)
Tx⁴		Must fit in 81 in. ht. and 80 in. dia. cylinder -----	Must be nondispersible in air ----- 451.26(h)

COMMERCIAL LOW-LEVEL RADIOACTIVE WASTE ACCEPTANCE CRITERIA			
	SPECIAL NUCLEAR MATERIAL	PACKAGE DIMENSIONS	INCINERATOR ASH
		451.27	
PA ⁴			
NY ⁴	350 g U-235 or 200 g U-233 or 200 g Pu ----- 383-8.6(a)(5)		
NC ⁵			
NE ⁵		Minimum size: 55-gal. drum. Class B or C (<1,000 R/hr) must be 6 ft 6 in. height and 6 ft 3 in. diameter. Class B or C (>1,000 R/hr) must be 9 ft 2 in. height and 3 ft 0 in. diameter (max sum of liner and cask 3 ft 5 in.). Maximum weight 30,000 lb. Maximum contact dose rate 30,000 R/hr. ----- 8.3.2 12.2 12.3 12.4 12.5 13.2	Must be treated to be nondispersible in air, exclusive of packaging. Class B and C ash must also be stabilized. ----- 8.24 9.3
MW ⁶		Discouraged from using extremely large or odd-shaped containers ----- C (4)	Dry powders and ash must be treated to be nondispersible in air. ----- B (5)

Waste Acceptance Criteria:

Dewatered Resin

Transuranics

Mixed Waste

COMMERCIAL LOW-LEVEL RADIOACTIVE WASTE ACCEPTANCE CRITERIA			
	DEWATERED RESIN	TRANSURANICS	MIXED WASTE
NRC	Accepted ----- 61.56(a)(3) 61.56(b)(2) BTP Section C.3 and C.4		
SC	Accepted ----- SCL Condition 36 SCL Condition 37 SCL Condition 38 BSC 13.16	Activity must be evenly distributed and incidental (≤%). Accepts whole smoke detectors with Am-241 foils. ----- SCL Condition 40 SCL Condition 41 BSC 13.10.2 for Pu BSC 13.12	Not accepted. Nonradioactively contaminated lead used for shielding may be accepted. No PCB allowed. Asbestos may be accepted. ----- SCL Condition 48 BSC 13.19 BSC 13.20 BSC 13.21 BSC 13.22
WA	Accepted ----- WAL Condition 28 WAL Condition 29 WAL Condition 36	Activity must be evenly distributed. Accepts whole smoke detectors and exempt consumer products. ----- WAL Condition 37 WAL Condition 38	
UT¹	A special evaluation is required before disposal. Ion exchange resins will be mixed with soil at a 9 parts soil:1 part resin ratio before emplacement ----- LTR-08/95 LTR-09/95 UT IN-05-96		Certain mixed wastes are acceptable. ----- UTL Condition 15 UTHWP
NV²	Accepted ----- Condition 24	Accepted whole smoke detectors and exempt consumer products ----- Condition 32	
CA³	Not accepted ----- Condition 59	Accepts whole smoke detectors and exempt consumer products ----- Condition 66	
IL⁴	Not accepted ----- 607.30(a)(3)		

COMMERCIAL LOW-LEVEL RADIOACTIVE WASTE ACCEPTANCE CRITERIA			
	DEWATERED RESIN	TRANSURANICS	MIXED WASTE
TX⁴			
PA⁴	Accepted, liquid \leq 4% by vol. ----- 236.521(4)		
NY⁴		Accepted in concentrations of \leq 100 nanocuries/g ----- 382.80 Table 1	Certain mixed waste are accepted ----- 383.8.6(b)
NC⁵	Accepted ----- 11.3(6)	May receive whole smoke detectors containing Am-241 foils ----- 11.3(7)	
NE⁵	Accepted ----- 8.14 8.16	Activity must be evenly distributed. Accepts intact exempt consumer products. Greater than Class A requires specific approval. ----- 8.22 8.23	
MW⁶	Accepted ----- B (12)		

Notes:

1. Utah license is restricted to less than Class A limits for most radionuclides.
2. Nevada WAC are no longer in effect.
3. California license has been issued and has withstood all legal challenges and appeals.
4. These are proposed or promulgated criteria developed by a state agency. Final WAC must be approved by the appropriate regulatory agency through guidance, regulations, or license conditions.
5. These are proposed/suggested criteria developed by the license applicant (NC and NE).
6. Midwest compact commission criteria are preliminary.